

IN THE CLAIMS

1. (currently amended) A method for replacing at least a portion of an intervertebral disc in a spinal column, comprising:

removing the portion of the intervertebral disc from the spinal column; and

inserting an apparatus for replacing the portion of the intervertebral disc,

~~wherein the apparatus for replacing the portion of the intervertebral disc is operable to permit respective vertebral bones of the spinal column between which the apparatus is positioned to articulate in flexion and extension in an anterior-posterior plane of the spinal column, lateral bending in a lateral plane of the spinal column, and axial rotation~~ the apparatus comprising a first member having a first vertebral contact surface for engagement with an endplate of a first of the vertebral bones in the spinal column, and a first articulation surface, the entirety of the first articulation surface being a single saddle surface that is defined by a concave arc having a substantially constant radius of curvature A about an axis perpendicular to leading and trailing ends of the first member and a convex arc having a substantially constant radius of curvature B about an axis perpendicular to lateral sides of the first member; the apparatus further comprising a second member having a second vertebral contact surface for engagement with an endplate of a second of the vertebral bones in the spinal column, and a second articulation surface, the entirety of the second articulation surface being a single saddle surface that is defined by a convex arc having a substantially constant radius of curvature C about an axis perpendicular to leading and trailing ends of the second member and a concave arc having a substantially constant radius of curvature D about an axis perpendicular to lateral sides of the second member, wherein the constant radius of curvature A is non-congruent with the constant radius of curvature C and the constant radius of curvature B is non-congruent with the constant radius of curvature D, and wherein the first and second articulation surfaces are operable to engage one another to permit flexion and extension in the anterior-posterior plane of the spinal column, lateral bending in the lateral plane of the spinal column, and axial rotation through a range of angles without permitting the vertebral bones to substantially move in directions directed away from one another along a longitudinal axis of the spinal column.

2. (original) The method of claim 1, wherein the apparatus for replacing the portion of the intervertebral disc is further operable to cause the vertebral bones to displace from one another at axial rotations outside the range of angles.

3. (cancelled).

4. (currently amended) The method of claim ~~3~~1, wherein the first member includes an anterior flange including at least one through hole, and the method further comprises inserting at least one bone screw through the at least one through hole to fasten the first member to the first vertebral bone.

5. (currently amended) The method of claim ~~3~~4 wherein the anterior flange of the first member includes at least two through holes, and the method further comprises inserting a bone screw through each of the through holes to fasten the first member to the first vertebral bone.

6. (currently amended) The method of claim ~~3~~1, wherein the second member includes an anterior flange including at least one through hole, and the method further comprises inserting at least one bone screw through the at least one through hole to fasten the second member to the second vertebral bone.

7. (currently amended) The method of claim ~~3~~1, wherein at least one of the first and second members further includes a curvate surface formed on its vertebral contact surface, and the method further comprises positioning the curvate surface to interface with a curvate portion of the endplate of the vertebral bone against which the vertebral contact surface is disposed.

8. (currently amended) The method of claim ~~31~~, wherein at least one of the first and second members further includes at least one spike formed on its vertebral contact surface, and the method further comprises urging the spike into the endplate of the vertebral bone against which the vertebral contact surface is disposed.

9. (currently amended) The method of claim ~~31~~, wherein the articulation surfaces are non-congruent in shape and maintain substantial point-to-point contact over a range of articulating movement between the vertebral bones.

10. (cancelled).

11. (currently amended) The method of claim ~~101~~, wherein at least one of: (i) the ~~first axis perpendicular to leading and trailing ends of the first member and the axis perpendicular to leading and trailing ends of the second member and second axes perpendicular to the anterior-posterior plane of the spinal column~~ are substantially coaxial; and (ii) the ~~first and second axes perpendicular to the lateral plane of the spinal column~~ axis perpendicular to lateral sides of the first member and the axis perpendicular to lateral sides of the second member are substantially coaxial.

12. (canceled).

13. (currently amended) The method of claim ~~31~~, wherein the first and second articulation surfaces are saddle shaped such that they are operable to engage when the first and second members are disposed in the intervertebral disc space to articulate in at least one of flexion, extension, lateral bending, and axial rotation.

14. (original) The method of claim 1, wherein the range of angles is about plus/minus three degrees from a resting position.

15. (original) The method of claim 1, wherein the apparatus is operable to permit the vertebral bones to displace away from one another at axial rotations outside the range of angles.

16. (currently amended) A method for replacing at least a portion of an intervertebral disc in a spinal column, comprising:

removing the portion of the intervertebral disc from the spinal column; and

inserting an apparatus for replacing the portion of the intervertebral disc, wherein:

the apparatus for replacing the portion of the intervertebral disc ~~includes:~~comprising (i) a first member having a first vertebral contact surface for engagement with an endplate of a first vertebral bone in the spinal column, and having a first saddle shaped articulation surface, the entirety of the first saddle shaped articulation surface being defined by a concave arc having a substantially constant radius of curvature A about an axis perpendicular to leading and trailing ends of the first member and a convex arc having a substantially constant radius of curvature B about an axis perpendicular to lateral sides of the first member, and (ii) a second member having a second vertebral contact surface for engagement with an endplate of a second vertebral bone in the spinal column, and having a second saddle shaped articulation surface, the entirety of the second saddle shaped articulation surface being defined by a convex arc having a substantially constant radius of curvature C about an axis perpendicular to leading and trailing ends of the second member and a concave arc having a substantially constant radius of curvature D about an axis perpendicular to lateral sides of the second member, wherein the constant radius of curvature A is larger than the constant radius of curvature C and the constant radius of curvature B is larger than the constant radius of curvature D;

an intervertebral disc space is defined substantially between the first and second endplates of the first and second vertebral bones, and

wherein the first and second articulation surfaces are sized and shaped to engage one another when the first and second members are disposed in the intervertebral disc space to enable the first and second vertebral bones to articulate in at least one of flexion, extension and lateral bending.

17. (cancelled).

18. (cancelled).

19. (cancelled).